Claims

1. Intramedullary nail (1) with a distal end (2) for insertion into the medullary canal, a proximal end (3), a central axis (4) and a generally rod-like shape over the hole length L,
characterized in that
said nail (1) has three distinct locking sections (5,6,7) with at least one through-hole (8) each for receiving locking screws whereby said three locking sections (5,6,7) are separated from each other by two distinct intermediate sections (9,10) having less through-holes (8) per length unit than each of said locking sections (5,6,7).

2. Intramedullary nail (1) according to claim 1, characterized in that said distinct intermediate sections (9,10) have no through-holes (8)

3. Intramedullary nail (1) according to claim 1 or 2, characterized by
A) a proximal locking section (5) extending from said proximal end (3) over the distance $0,22\ L < L_5 < 0,28\ L$ in direction of said distal end (2) and having a distal boundary (11);
B) a distal locking section (6) extending from said distal end (2) over the distance $0,18\ L < L_6 < 0,22\ L$ in direction of said proximal end (3) and having a proximal boundary (12); and
C) an isthmus locking section (7) located between said distal and proximal locking sections (5,6) with a proximal boundary (13) and a distal boundary (14) and a length of $0,08\ L < L_7 < 0,15\ L$.

4. Intramedullary nail (1) according to claim 3, characterized in that said proximal boundary (13) of said isthmus locking section (7) has a distance $0,27\ L < L_9 < 0,33\ L$ to said distal boundary (11) of said proximal locking section (5).

5. Intramedullary nail (1) according to claim 3 or 4, characterized in that said distal boundary (14) of said isthmus locking section (7) has a distance $0,13\ L < L_{10} < 0,30\ L$ to said proximal boundary (12) of said distal locking section (6).

6. Intramedullary nail (1) according to one of the claims 3 to 5, characterized in that $0,32\ L < (L_{10} + L_6) < 0,50\ L$.

7. Intramedullary nail (1) according to one of the claims 1 to 6, characterized in that it has a first intermediate section (9) having the length L_9 between said proximal locking section (5) and said isthmus locking section (7) and preferably having no through holes (8).

8. Intramedullary nail (1) according to one of the claims 1 to 7, characterized in that said it has a second intermediate section (10) between said distal locking section (6) and said isthmus locking section (7) having the length L_{10} and preferably having no through holes (8).

9. Intramedullary nail (1) according to one of the claims 1 to 8, characterized in that said isthmus locking section (7) has two through holes (8), preferably arranged at a relative angle α in the range of $60° < \alpha < 120°$.

10. Intramedullary nail (1) according to one of the claims 1 to 9, characterized in that the through hole (8) which is located nearest to said distal end (2) has a distance L_D to said distal end (2) in the range of $0{,}01\ L < L_D < 0{,}38\ L$.

11. Intramedullary nail (1) according to one of the claims 1 to 10, characterized in that the through hole (8) which is located nearest to said proximal end (3) has a distance L_P to said proximal end (3) in the range of $0{,}01\ L < L_P < 0{,}70\ L$.

12. Intramedullary nail (1) according to one of the claims 1 to 11, characterized in that said proximal locking section (5) having the length L_5 and said first intermediate section (9) having the length L_9 are arranged at an angle β in the range of $7° < \beta < 13°$.

AMENDED CLAIMS

[received by the International Bureau on 8 March 2005 (08.03.2005);
original claim 1 amended; original claim 12 cancelled; remaining claims unchanged (2 pages)]

1. Intramedullary nail (1) with a distal end (2) for insertion into the medullary canal, a proximal end (3), a central axis (4) and a generally rod-like shape over the hole length L,

characterized in that

A) said nail (1) has three distinct locking sections (5,6,7) with at least one through-hole (8) each for receiving locking screws whereby said three locking sections (5,6,7) are separated from each other by two distinct intermediate sections (9,10) having less through-holes (8) per length unit than each of said locking sections (5,6,7); and

B) said proximal locking section (5) having the length L_5 and said first intermediate section (9) having the length L_9 are arranged at an angle β in the range of $7° < \beta < 13°$.

2. Intramedullary nail (1) according to claim 1, characterized in that said distinct intermediate sections (9,10) have no through-holes (8)

3. Intramedullary nail (1) according to claim 1 or 2, characterized by

A) a proximal locking section (5) extending from said proximal end (3) over the distance $0,22\ L < L_5 < 0,28\ L$ in direction of said distal end (2) and having a distal boundary (11);

B) a distal locking section (6) extending from said distal end (2) over the distance $0,18\ L < L_6 < 0,22\ L$ in direction of said proximal end (3) and having a proximal boundary (12); and

C) an isthmus locking section (7) located between said distal and proximal locking sections (5,6) with a proximal boundary (13) and a distal boundary (14) and a length of $0,08\ L < L_7 < 0,15\ L$.

4. Intramedullary nail (1) according to claim 3, characterized in that said proximal boundary (13) of said isthmus locking section (7) has a distance $0,27\ L < L_9 < 0,33\ L$ to said distal boundary (11) of said proximal locking section (5).

5. Intramedullary nail (1) according to claim 3 or 4, characterized in that said distal boundary (14) of said isthmus locking section (7) has a distance $0,13\ L < L_{10} < 0,30\ L$ to said proximal boundary (12) of said distal locking section (6).

6. Intramedullary nail (1) according to one of the claims 3 to 5, characterized in that 0,32 $L < (L_{10} + L_6) < 0{,}50\ L$.

7. Intramedullary nail (1) according to one of the claims 1 to 6, characterized in that it has a first intermediate section (9) having the length L_9 between said proximal locking section (5) and said isthmus locking section (7) and preferably having no through holes (8).

8. Intramedullary nail (1) according to one of the claims 1 to 7, characterized in that said it has a second intermediate section (10) between said distal locking section (6) and said isthmus locking section (7) having the length L_{10} and preferably having no through holes (8).

9. Intramedullary nail (1) according to one of the claims 1 to 8, characterized in that said isthmus locking section (7) has two through holes (8), preferably arranged at a relative angle α in the range of $60° < \alpha < 120°$.

10. Intramedullary nail (1) according to one of the claims 1 to 9, characterized in that the through hole (8) which is located nearest to said distal end (2) has a distance L_D to said distal end (2) in the range of $0{,}01\ L < L_D < 0{,}38\ L$.

11. Intramedullary nail (1) according to one of the claims 1 to 10, characterized in that the through hole (8) which is located nearest to said proximal end (3) has a distance L_P to said proximal end (3) in the range of $0{,}01\ L < L_P < 0{,}70\ L$.